

# 1964 ANNUAL INDEX

## Volume 36—January to December

Including 26 regular issues of MACHINE DESIGN plus four special issues—*The Electric Motors Reference Issue*, *The Seals Reference Issue*, *The Plastics Reference Issue* and *The Electric Controls Reference Issue*. Only articles and editorial items one-half page or larger are indexed.

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Squeeze-Type .....	Everett	8/6/11, 59	(8.0)
Diaphragm Seals .....	Taplin	8/6/11, 67	(5.0)
Static O-Ring Seals .....	Everett	8/6/11, 72	(3.0)
Nonmetallic Gaskets .....	Smoley	8/6/11, 75	(15.0)
Metallic Gaskets: General Types .....	Dunkle	8/6/11, 90	(9.0)
O-Ring Type Metallic Gaskets .....	Gastineau	8/6/11, 99	(3.0)
Sealants .....	Spinell	8/6/11, 102	(13.0)
Seals for Nonlube Service .....	Arnold	7/2, 134	(3.1)
TFE Fluorocarbons for Gaskets and	Horvath	9/24, 166	(7.0)
Packings .....	News	10/22, 14	(0.7)
Molecular Pumps Back Up SNAP-8 Shaft	Scan	1/2, 114	(0.5)
Seals .....	Scan	3/26, 175	(0.7)
Pressure Controls Antileakage Rings ..	Scan	12/17, 149	(0.5)
Strip-Type Tire Provides Adjustable-Seal	Scan		
Expanding Cylinder Prevents O-Ring	Scan		
Pinch .....	Scan		

### 27. Valves

Hydraulic Systems, Part 5: Selecting Con-	Henke	7/16, 172	(3.0)
trol Valves .....	News	5/21, 10	(0.6)
Hot-Gas Valve Passes Flow-Control Tests	Scan	1/16, 165	(0.5)
Concentric Valves Provide High-Speed	Scan		
Squirt .....	Scan		

Nonlinear Spring Maintains Constant	Scan	2/13, 170	(1.0)
Valve Flow .....	Scan	2/13, 172	(0.5)
Dual-Flow Poppet Prevents Rebound ..	Scan	2/27, 145	(0.5)
Floating Air Valve Adjusts Mixture ..	Scan	2/27, 147	(1.0)
Tilting Valve Drains Itself .....	Scan	3/26, 177	(0.5)
Static Head Maintains Constant Valve	Scan	4/23, 227	(1.0)
Pressure .....	Scan	5/21, 179	(0.5)
Squeezed Sleeve Controls Flow .....	Scan	5/21, 180	(0.5)
Spherical Valve Seals Despite Misalign-	Scan	6/18, 185	(1.0)
ment .....	Scan	7/2, 114	(0.5)
Flexible "Doughnut" Forms Adjustable	Scan	8/13, 132	(1.0)
Orifice .....	Scan	11/19, 175	(1.0)
Flexed Strip Opens Slice Valve .....	Scan	12/17, 149	(0.5)
Valve Uses Material Energy for Shut-Off	Scan	12/17, 151	(0.5)
Stretched Webs Snap Open Valve .....	Scan	12/17, 152	(1.0)
Eccentric Cams Actuate Valves .....	Scan	10/22, 174	(2.0)
Inertia Controls Sloping Valve Flow ..	DIA		
Fluid Pressure Operates Ganged Valves	DIA		
Tapped Holes Create Turbulent Flow ..	DIA		
Exploding Valves Guard Rocket-Propel-	DIA		
lant Plant .....	DIA		

### 28. Instruments and Controls

Fluid Amplifiers .....	Kirshner	12/17, 171	(3.4)
Pneumatic Leak Measures Thread Ac-	News	1/30, 112	(0.5)
curacy .....	News	5/21, 181	(0.5)
Stepped Venturi Increases Pressure Dif-	News	12/3, 8	(0.6)
ferential .....	Scan	1/2, 112	(1.0)
Ten Times Faster Fluid Amplifier Oscil-	Scan	1/2, 116	(0.5)
lates Its Power Jet .....	Scan	1/2, 116	(0.5)
Sliding Rotor Balances Itself .....	Scan	1/16, 165	(0.5)
Floating Rig Maintains Alignment .....	Scan	4/9, 138	(1.0)
Perpendicular Turbine Buckets Eliminate	Scan	4/23, 224	(0.5)
Thrust .....	Scan	6/4, 130	(0.5)
Pressure Regulates Temperature .....	Scan	7/16, 143	(0.5)
Stroboscopic Prism Measures Fluid Veloc-	Scan	7/16, 144	(0.5)
ity .....	Scan	8/13, 133	(0.5)
Flow Pattern Controls Output Signal ..	Scan	8/27, 157	(0.5)
Venturi Effect Compensates Flow .....	DIA	5/21, 168	(1.0)
Rolling Magnet Indicates Pressure Dif-	DIA		
ferential .....	DIA		
Low-Speed Oval Gears Measure Large	DIA		
Flow .....	DIA		
Sensing Blanket Isolates Fluid .....	DIA		
Pressure Controls Spring Snap-Over ..	DIA		
Roving Weight Balance Measures Pres-	DIA		
sure Changes .....	DIA		

### 29. Systems and Assemblies

Low-Temperature Refrigerators .....	Long	1/16, 206	(4.4)
Hydrostatic Transmissions .....	Wilson	3/26, 178	(10.0)
Hydraulic Systems, Part 1: Energy	Henke	5/7, 144	(5.0)
Transfer .....	Henke	5/21, 172	(6.0)
Hydraulic Systems, Part 2: Optimizing	Henke	6/4, 144	(7.0)
Pressure and Flow .....	Pippinger	6/18, 199	(4.0)
Hydraulic Systems, Part 3: Controlling	Henke	7/30, 108	(5.0)
Pressure, Flow, and Direction .....	Henke	8/13, 126	(6.0)
Hydraulic System Leakage .....	Henke	8/27, 166	(8.0)
Hydraulic Systems, Part 6: Selecting	Henke	9/10, 206	(7.0)
Auxiliary Components .....	Henke	9/24, 173	(10.0)
Hydraulic Circuits, Part 7: Types of	Roy	11/5, 159	(4.0)
Circuits .....	Wilson	11/19, 168	(7.0)
Hydraulic Systems, Part 8: Analyzing	Skaisis	11/19, 197	(4.0)
Load Types .....	News	6/4, 24	(1.0)
Hydraulic Systems, Part 9: Circuit Syn-	News	10/22, 26	(0.5)
thesis .....	Scan	2/27, 144	(1.0)
Hydraulic Systems, Part 10: Applying	Scan	4/23, 224	(0.5)
Switching Theory .....	Scan	5/7, 142	(2.0)
Predicting Blower Performance .....	Scan	7/16, 146	(0.5)
Differential Hydrostatic Transmissions ..	Scan	7/30, 98	(1.0)
Noise in Hydraulic Systems .....	Scan	11/5, 157	(0.5)
Total Performance Dinosaurs .....	DIA	2/27, 128	(2.0)
Ground-Effect Grass Cutter .....	DIA	3/12, 148	(1.0)
Shuttling Rocker Adjusts Brake Force ..	DIA	4/9, 124	(2.0)
Air Screen Encloses Flying Debris .....	DIA	4/23, 214	(2.0)
Panic-Proof Brake System Reduces Skid	DIA	11/5, 148	(1.0)
Hazard .....	DIA		
Spring Pinch Controls Pulsing Flow .....	DIA		
Pressurized Tube Slows Centrifuge Flow	DIA		
Porous Plate Provides Pneumatic "Mag-	DIA		
netism" .....	DIA		
Hydraulics and Bogie Wheels Drag Away	DIA		
Saturn Gantry .....	DIA		
Silent Pile Driver Operates on "Quag-	DIA		
miere" Principal .....	DIA		
Gas Gun Lifts Test Package To Test	DIA		
Weightless Fuel .....	DIA		
Hydraulic Transmission Control Maintains	DIA		
Nonslip Shifting .....	DIA		
Mileage Controls Chassis Lubricator .....	DIA		

# Mechanical Drives, Controls and Systems

## 31. Engines, Atomic Power, Power Sources

Lunar Gap Narrowed by Centaur Success	(Article)	1/2, 88	(6.0)
Engine for Indianapolis	(Article)	2/27, 120	(6.0)
Atomic Power, Part 1: Central Power Stations	Wise	4/9, 116	(8.0)
Atomic Power, Part 2: Reactors for Propulsion	Wise	4/23, 198	(8.0)
Atomic Power, Part 3: Portable and Mobile Reactors	Wise	5/7, 134	(6.0)
Turbine Truck Unveiled	(Article)	10/22, 168	(6.0)
V-6 Diesel Shapes Fuel-Air Mixtures for Best Efficiency	News	1/2, 12	(0.6)
Oxidizer Additive Passes First Compatibility Tests	News	1/30, 8	(0.5)
Push-Producing Electrons Bounce Out of Space Engine	News	2/27, 6	(1.0)
Gas-Turbine Engine Enters Big-Time Racing	News	5/7, 8	(0.7)
Solid-Rocket Modules Will Lock Together to Power Any Mission	News	5/21, 6	(0.8)
Safety, High Thrust, Low Cost	News	6/4, 6	(1.0)
Full Size Solid Rocket Passes First Test	News	6/18, 12	(0.5)
SERT-1 Experiment Proves Ion Engines Will Work in Space	News	7/30, 10	(1.0)
Sunken SNAP Beams Out Navigational Signals	News	8/13, 8	(0.6)
SNAP-50/SPUR Model Passes Spinning-in-Potassium Tests	News	9/24, 12	(0.6)
Steam-Fired Missile Saves Wear on the Launch Pad	News	10/8, 6	(0.7)
First SNAP-8 Strives for 10,000-hr Continuous Life	News	10/8, 12	(0.5)
Arc Chooses Its Path in a New Type of Spark Plug	News	10/22, 10	(0.5)
Newest of '65s: Sports-Car Handling and Zero to 60 in 7 Sec	News	12/3, 14	(0.5)
Stubby Stack of Dredger Requires Fan Assist	DIA	1/2, 96	(1.0)
Individual Engines Drive BARC's Ten-Foot Wheels	DIA	3/12, 147	(1.0)
Chambered Crankcase Improves Outboard Motor Efficiency	DIA	7/30, 90	(2.0)
Volkswagen Engine Powers Cart	DIA	11/5, 149	(1.0)

## 32-34. Drives, Transmissions, Drive Components

V-Belt Drives	Lavoie	1/16, 179	(9.5)
Designing Planetary Gear Trains	Myatt	1/16, 203	(2.0)
The Limitations of Epicyclic Gears	Tuplin	1/30, 124	(3.0)
O-Ring Drives	Boyce	2/13, 166	(4.0)
Gear Noise	Schlegel	2/27, 134	(9.0)
Operating Pressure Angle of Enlarged Spur Pinions	Michalec	4/23, 247	(4.0)
Surface Durability of Helical Gears	Wellauer	5/7, 156	(9.0)
Traction Drives, Part 1	Kraus	7/2, 106	(6.6)
Traction Drives, Part 2	Kraus	7/16, 147	(6.0)
Epicyclic Gear Train	Lewis	7/16, 175	(5.0)
New Tooth Shape Distributes Stresses	News	6/4, 10	(0.6)
Projecting Pins Keep New Drive Belt	News	6/4, 12	(0.7)
60-Million Dollar Crystal Ball	News	6/4, 24	(1.0)
Flexible Rack Rolls Around Corner	Scan	1/16, 162	(1.0)
Pinched Planets Control Speed	Scan	2/13, 144	(1.0)
Louvers Form Gear Teeth	Scan	4/9, 141	(0.5)
Orbiting Belts Provide Counter-Rotation	Scan	5/7, 153	(0.5)
Shuttling Ball Provides One Way Drive	Scan	6/18, 181	(1.0)
Soft Rim Provides for Belt Bite	Scan	6/18, 183	(0.5)
Deformable Rotor Produces Low-Speed Output	Scan	7/16, 142	(1.0)
Traveling Worm Indicates Torque	Scan	10/22, 187	(1.0)
Vacuum Actuates Tape Drive	Scan	12/17, 151	(0.5)
In-Line Drive Simplifies Helicopter Transmission System	DIA	7/30, 86	(1.0)
Missile Tower Drive Prevents Slipping and Skewing	DIA	8/27, 146	(2.0)
Tapered Rack Simplifies Blade Hoist Design	DIA	11/19, 157	(1.0)

## 351, 352. Bearings

TFE-Fabric Bearings	Cress	1/16, 154	(8.0)
Predicting Bearing Torque in Large Diameter, Thin-Section Bearings	Burgmeier	1/30, 118	(6.0)
Misaligned Roller Bearings	Dareing	2/13, 175	(5.0)
Unusual-Precision Bearings	Hanau	2/27, 148	(6.0)
Gas Bearings	Sternlicht	4/9, 162	(4.0)
MHD Bearings	Kuzma	4/23, 206	(5.0)
Cryogenic Bearings	Hanau	6/4, 122	(7.0)
Metallic Flexures	Rothruss	9/10, 218	(5.5)
The Four-Point Contact Bearing, Part 1	Duguid	9/24, 150	(5.0)
The Four-Point Contact Bearing, Part 2	Duguid	10/8, 164	(5.0)
Instrument Bearing Torque	Christophor	10/22, 197	(3.0)
High-Temperature Bearings	Anderson	11/5, 163	(19.0)
Magnetic and Electrostatic Bearings	McHugh	11/5, 191	(3.6)
Out-of-Round Bearings	Goldberg	11/19, 191	(5.0)
Standard-Priced Bearing Lasts Six Times as Long	News	1/2, 8	(0.8)
Air-Turbine Rotor Spins on Gas Bearings at 73,600 rpm	News	5/21, 8	(0.6)
Foam Slab Distributes Air-Film	Scan	5/21, 182	(0.5)
Flexible Orifice Adjusts Bearing Flow	Scan	8/27, 155	(1.0)
Composite Bearing Transmits Axial and Radial Motion	Scan	12/3, 155	(0.5)

Balanced Bearing Loads Prevent Wheel Slip	DIA	3/12, 144	(2.0)
Rafts Float Lathes Down Oil Bearing Assembly Line	DIA	12/3, 140	(2.0)
Multistation Drilling Machine Rides on Ball Bushings	DIA	12/3, 143	(1.0)

## 353-359. Clutches, Brakes, Shafts, Couplings

Hooke's Joints	Bossler	6/18, 194	(5.0)
Disc Brakes	Parker	7/16, 180	(3.4)
Shaft Couplings	Wood	12/17, 157	(2.0)
New Light-Weight Contenders	News	1/30, 23	(0.5)
Flexible-Rigid Coupling Absorbs Shaft-Misalignment Stresses	News	2/27, 14	(0.7)
Flat Ball Joint Transmits Torque	News	5/21, 180	(0.5)
Beryllium Brakes Refused to Wear Out	News	6/18, 6	(0.5)
Road Push on Front Wheels Actuates Truck's Rear Brakes	News	11/19, 8	(0.9)
Misalignment Stresses Are Shared Among Coupling's Truss Members	News	12/17, 6	(0.6)
Coupling Adjusts Itself to Accommodate Misalignment	Scan	1/2, 113	(0.5)
Belt Steers Roller to Maintain Alignment	Scan	1/2, 113	(0.5)
Spinning Cone Spreads Thin Film	Scan	3/12, 156	(1.0)
Flexing Rod Transmits Thrust	Scan	3/26, 176	(0.5)
Balls Form Snap Action Toggle	Scan	6/4, 131	(1.0)
Wobble Plate Transmits Rotary Motion	Scan	6/18, 184	(0.6)
Nested Splines Provide Concentric Drive	Scan	7/30, 101	(1.0)
Flexing Diaphragm Accommodates Torque Without Rotation	Scan	8/13, 133	(0.5)
Wedge Rollers Lock Drive	Scan	8/27, 156	(1.0)
Tension Actuates Pinched-Roller Brake	Scan	10/8, 158	(1.0)
Rotary Coupling Doesn't Push	Scan	11/5, 157	(0.5)
Elastic Rollers Soak Up Shock	Scan	12/3, 155	(0.5)
Double-Surface Drum Brakes Small Planes	DIA	4/9, 128	(1.0)
Self-Compensating Hydraulic System Balances Braking Force	DIA	4/23, 211	(1.0)
Multicompartment Wheel Drives Experimental Car	DIA	7/16, 132	(1.0)
Flexible Shafts Move VTOL Nacelles	DIA	8/13, 125	(1.0)
Spinning Sponge and Shifting Rollers Generate Suds	DIA	9/10, 169	(1.0)
Slipping Clutch Governs Tractor Speed	DIA	11/19, 158	(2.0)
Centered Axle Lengthens Trailer Tire Life	DIA	12/3, 144	(1.0)

## 36. Mechanisms

Four-Bar Linkages for Straight-Line Motion	Kraus	2/13, 186	(5.0)
Double-Lever Mechanisms	Tao	3/12, 159	(8.0)
Four-Bar Linkages	Tao	3/26, 190	(7.0)
Balancing Loaded Linkages	Tao	4/9, 151	(6.0)
Space Crank Mechanisms	Harrisberger	9/10, 170	(6.0)
Rotating Cams Lower the Walking Gear	News	2/13, 12	(0.5)
Picture-Taking Robot Would Tumble Over the Moon	News	3/26, 8	(0.7)
Wayward Belt Aligns Itself	News	5/21, 181	(0.5)
Paddlewheel Blade	News	9/10, 24	(0.5)
Self-Erecting Space Structures	News	11/5, 22	(0.7)
Wire Tendons Control Spring Arm	Scan	1/2, 115	(1.0)
Couple Transfer Wheel Loads	Scan	1/2, 117	(1.0)
Axial Cam Indicates Power	Scan	2/27, 143	(1.0)
Temperature Controls Fan Pitch	Scan	4/23, 223	(1.0)
Adjustable Weights Cancel Imbalance	Scan	5/7, 154	(1.0)
Rotating Mounts Distribute Spring Load	Scan	7/2, 115	(1.0)
Radial Teeth Provide for Face-Cam Adjustment	Scan	7/30, 99	(0.6)
Acceleration Actuates Ball Clamp	Scan	9/10, 176	(1.0)
Balance Spools Compensate for Oscillation	Scan	9/24, 155	(1.0)
Angled Link Converts Rotary Motion to Reciprocating	Scan	9/24, 158	(0.5)
Flat Rollers Control Belt Drive	Scan	10/8, 159	(1.0)
Reflections Indicate Alignment	Scan	10/8, 160	(0.5)
Two-Part Feet Allow Bubble Chamber to Shuffle in Any Direction	DIA	1/2, 94	(2.0)
Versatile Film Cartridge Holds, Measures, and Moves the Film	DIA	2/13, 156	(2.0)
Rack and Pinion Ensures Positive Bulb Ejection	DIA	2/13, 158	(1.0)
Door-Hinge Rotor Reduces Drag and Vibration	DIA	2/13, 159	(1.0)
Magazine-Loaded Tape Recorder Stores Instant Phone Numbers	DIA	2/27, 130	(2.0)
Light Gate Blocks Heat When Endless Film Is Stopped	DIA	3/12, 142	(2.0)
Dial Plate Updates Combination Lock	DIA	4/23, 212	(2.0)
Archimedes Works for Finnish Log Weigher	DIA	5/7, 140	(1.0)
Rotating Take-Up Assembly Puffs Power Cable	DIA	7/12, 105	(1.0)
Speedometer Recorder Keeps Track of Driver	DIA	7/16, 133	(1.0)
Trident Jet Rides on Off-Center Nose-wheels	DIA	7/16, 134	(2.0)
Wind-Up Racer Does 40 mph	DIA	10/22, 176	(1.0)
Reduced-g Accelerator Simulates Space-Bound Fuel Tank	DIA	11/5, 147	(1.0)
Powered Ladder Maneuvers in Space Tank	DIA	12/17, 139	(1.0)



## Assembly Components

### 41. Fasteners

Metal-in-Plastic Inserts	Strasser	1/16, 174	(5.0)
Determining Preload in a Bolted Joint	Baumgartner		
		2/13, 180	(6.0)
Designing for Semitubular Riveting	Buchanan	3/12, 150	(6.0)
Fastening Wire Forms	Wayne	7/2, 116	(3.0)
Corrosion in Threaded Fasteners	Hood	12/17, 153	(4.0)
Adjustable Locknut Holds Without Thread Squeeze	Scan	1/30, 110	(0.5)
Triple Piston Controls Bolt Lock	Scan	9/24, 159	(0.6)

### 42. Springs, Vibration and Shock Isolators

Storing Energy in Springs	Gwinn	3/26, 166	(7.0)
Compression Springs	Chandler	8/13, 159	(4.0)
New Suspension Smooths the Ride of Off-Highway Hauler	News	7/16, 8	(0.5)
New Viscoelastic Damping Material Flattens the Resonance Curve	News	8/13, 12	(0.5)
Pinched Elastomer Absorbs Shock	Scan	1/16, 163	(0.5)
Resilient Shaft Absorbs Shock	Scan	2/13, 172	(0.5)

Pivoted Spring Contacts Clutch Engagement	Scan	2/27, 146	(0.5)
Shattering Tube Is One-Shot Shock Absorber	Scan	4/9, 139	(0.5)
Stacked Springs Provide Adjustable Rate	Scan	6/4, 130	(0.5)
Buckled Column Is Constant-Force Spring	Scan	9/10, 178	(1.0)
Spring Wrap-Up Controls Torque	Scan	10/22, 184	(1.0)
Falling Weight Simulates Nuclear Blast	DIA	9/10, 166	(2.0)

### 43. Other Assembly Components

Parts for Automatic Feeding	Taylor	3/26, 188	(2.0)
SST Tire Design Poses No New Problem	News	7/16, 6	(0.6)
Automobile Aquaplaning	News	7/16, 26	(1.0)
Ice-Gripping Studs Go On Production Tires	News	10/22, 6	(0.6)
Twenty Wheels Land a Big Jet on an Unpaved Field	News	11/5, 8	(0.7)
New Fiber Combination Builds Comfort into the Radial-Ply Tire	News	11/5, 14	(0.6)
Flexible Strips Form Rigid Boom	Scan	7/16, 146	(0.5)

## Materials

### 51, 52. Metals

Low Temperature Steels	Parker	1/2, 100	(12.0)
Residual Stresses in Steel	Littmann	2/27, 166	(3.2)
Cast Irons and Steels	Wallace	3/12, 169	(32.0)
Refractory Metals	Keeler	7/2, 86	(6.0)
Tensile Strength in the Plastic Range	Gavalis	7/2, 129	(5.0)
High Temperature Steels	Hall	6/4, 136	(8.0)
Beryllium-Copper Alloys	Winkle	7/16, 153	(19.0)
Physical Properties	Borg	7/30, 113	(2.0)
Malleable-Iron Castings	(Article)	8/13, 140	(3.0)
Aluminum Impact Extrusions	Katz	8/27, 150	(5.0)
How To Select Brazing Alloys	Lawless	8/27, 174	(11.0)
Five Ways to Improve Gray-Iron Castings	Caine	10/22, 200	(1.0)
Putting Muscles in Metals	Nachtman	11/19, 162	(6.0)
Toughness and Ductility of Metals	Sachs	12/3, 157	(4.0)
Giant Loom Weaves Metal	News	6/18, 10	(0.5)
Heat Treating While Brazing Saves Operation	Scan	1/2, 114	(0.5)
Pleats Permit Honeycomb Flexing	Scan	7/16, 144	(0.5)
Welded Rollup Forms Spiral Condenser	Scan	9/10, 177	(0.5)

### 53. Plastics

TFE-Fabric Bearings	Cress	1/16, 154	(8.0)
Polyimides	Todd	4/23, 228	(10.0)
Filament Winding Goes Commercial	Keegin	5/7, 130	(4.0)
Fluorocarbon Plastics	Ricklin	5/7, 149	(3.0)
Selecting Plastics	Jacob	P 9/17, 4	(8.0)
Designing with Plastics	(Chapter)	P 9/17, 12	(7.0)
Forming and Fabricating	Carlton	P 9/17, 19	(4.0)
Assembly Methods	(Chapter)	P 9/17, 23	(7.0)
Decoration and Surface Finish	Scharnberg		
		P 9/17, 30	(3.0)
Laminated Plastics	Muller	P 9/17, 53	(6.0)
Reinforced Thermosets	Sprang	P 9/17, 39	(3.0)
Reinforced and Filled Thermoplastics	Murphy	P 9/17, 42	(5.0)
ABS	Whitney	P 9/17, 47	(4.0)
Acetals	Hardesty	P 9/17, 51	(5.0)
Acrylics	Pierson	P 9/17, 56	(2.0)
Cellulose Acetate	Black	P 9/17, 58	(2.0)
Cellulose Propionate	Black	P 9/17, 60	(1.4)
Ethyl Cellulose	Bird	P 9/17, 61	(2.0)
Cellulose Acetate Butyrate	Hill	P 9/17, 63	(1.5)
Chlorinated Polyethers	Hanna	P 9/17, 65	(2.0)
TFE-FEP Fluorocarbons	Jolley	P 9/17, 67	(6.5)
CTFE Fluorocarbons	Bringer	P 9/17, 73	(2.5)
Polyamides (Nylons)	Carawell	P 9/17, 76	(4.0)
Polycarbonates	McCubbin	P 9/17, 80	(3.0)
Polyethylenes	Estes	P 9/17, 83	(4.0)

Polyimides	Todd	P 9/17, 87	(5.0)
Polypropylenes	Jones	P 9/17, 92	(4.0)
Polystyrenes	Otting	P 9/17, 96	(5.0)
Vinyls	Bulkley	P 9/17, 101	(6.0)
Alkyds	Beers	P 9/17, 107	(2.0)
Allyls	Beacham	P 9/17, 109	(3.0)
Amines	Sunderland		
		P 9/17, 112	(4.0)
Epoxies	Reese	P 9/17, 116	(3.0)
Phenolics	Borro	P 9/17, 119	(4.0)
Polyesters	Carpenter	P 9/17, 123	(3.0)
Silicones	Kin	P 9/17, 126	(4.0)
Urethanes	Backus	P 9/17, 130	(4.0)
TFE Fluorocarbons for Gaskets and Packings	Horvath	9/24, 166	(7.0)
Plastic-Shoe Leather Tries Industrial Jobs	News	6/18, 10	(0.5)
Glass Fiber Motor Cases Test Out Stronger	News	7/30, 12	(0.6)
Metal Ions Hold Together a New Type of Plastic	News	9/24, 10	(0.6)
Graph Matching Locates the Proper Thermoplastic	News	10/8, 8	(0.6)
New Process Promises to Tailor Plastics to Each Particular Job	News	12/17, 10	(0.5)
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Squashed Cylinder Records Shock	Scan	8/13, 134	(1.0)
Resilient Roll Controls Bend Radius	Scan	8/27, 157	(0.5)

### 54-58. Nonmetallics (except Plastics), Composites

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Transparent Materials	Wittman	4/23, 286	(2.6)
Wood Technology	Barnes	7/30, 78	(8.0)
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Self-Dimming Glass Cuts Glare Out of Sunlight	News	2/13, 8	(1.0)
Laminate Core Reduces Stresses by Reinforcing Itself to the Skins	News	4/9, 14	(0.6)
Foaming Bulkheads May Plug Punctures in Spacecraft	News	7/30, 14	(0.5)
Pyroceram Hull Designed for Deep-Sea Vehicle	News	8/27, 6	(1.0)
Bearing Steel Extrudes Before Molybdenum Disulfide Breaks Down	News	9/10, 8	(0.5)
Increasing MoS <sub>2</sub> Content Improves Properties of Greases	News	11/19, 12	(0.5)
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Chrysler Instrument Panel Named Zinc Die Casting of the Year	News	10/8, 14	(0.7)
Core Dissolving Provides Key to Complex Die Castings	News	12/17, 14	(0.5)
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Button Welding	Mott	11/5, 150	(6.0)
The Shell Takes Shape: Aluminaut Readies for Sea	News	3/26, 6	(1.0)
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## 77. Experimental, Advanced Design

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"Instant Infantry" Fights Anywhere Within 45 Minutes	News	3/12, 14	(0.9)
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